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ABSTRACT

Attitudes of Negro parents toward the value of education for their children were changed significantly and postively by computer-assisted instruction (CAI). A remote terminal located in a rural school was used by the subjects, all Negro parents of school children. Concurrently, the same material was given to a similar group by lecture/discussion method, and there was a third group which received no instruction. All subjects were administered pre- and post-tests designed to measure attitudes following the instruction phase. Unlike the results from computer-assisted instruction, there was no significant attitude change resulting from the lecture/discussion instruction. The conclusion was drawn that CAI is a technique with high potential for application to adult education. Appendices include a sample of the CAI lesson, pre- and post-test items, the achievement test, and mention of participating agencies. (Author/MF)

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TECH REPORT

AN INVESTIGATION OF THE RELATIVE EFFECTIVENESS OF TWO METHODS OF INSTRUCTION, INCLUDING COMPUTER-ASSISTED INSTRUCTION, AS TECHNIQUES FOR CHANGING THE PARENTAL ATTITUDES OF NEGRO ADULTS

Francis Worth Scanland

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The tests indicated that the subjects' attitudes were changed significantly and positively by the CAI, and were not changed significantly by the lecture/discussion instruction. The conclusion was drawn that Computer-Assisted Instruction is a technique with high potential for application to adult education. Continued investigation in this area is indicated.

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TABLE OF CONTENTS

ABSTRACT ii
ACKNOWLEDGEMENTS iii
LIST OF TABLES vii

Chapter
I. INTRODUCTION 1
Background
Need for the Investigation
Purpose and Objective of the Investigation
Hypotheses

II. RELATED LITERATURE 8
Review of the Literature
Description of Available Attitude-Changing Treatments
Description of CAI and Related Literature

III. METHOD AND PROCEDURE OF THE STUDY 14
General
A Description of the Instructional Materials
Evaluation Procedures and Design

IV. ANALYSIS OF THE DATA 20
Testing the Hypotheses
Other Findings and Inferences

V. DISCUSSION 34
Interpretation
The Outcomes of the Tests
The Meaning of the Negative Change
The Need for Reading Ability
Applicability of CAI for Adult Education
Implications
The Outcomes of the Tests
The Meaning of the Negative Change
The Need for Reading Ability

APPENDIX
A. Sample of CAI Lesson 41
B. The Pre- and Posttest Items 50
C. Achievement Test 60
D. Participating Agencies 66

REFERENCES 68

VITA 74

LIST OF TABLES

TABLE		Page
1.	Means of scores on pre- and posttest attitude measures	21
2.	Analysis of variance of means of pre- and posttest attitude measures	21
3.	Means and standard deviations of the known variables for all subjects by groups and together	23
4.	Correlation coefficients of seven variables by groups	24
5.	Analysis of variance with repeated measures for the three groups, using the pre- and posttest scores on attitude measure	27
6.	An analysis of covariance, all three groups, pre- and posttest scores on attitude measures	28
7.	An analysis of variance, all three groups, reading scores	29
8.	Means of pre- and posttest attitude scores adjusted for reading ability	29
9.	Means and standard deviations, scores on achievement test	30
10.	One-way analysis of variance on scores of achievement test for all subjects	31
11.	One-way analysis of variance on scores of achievement test for Groups A and B	31
12.	Coefficients of determination R^2 for all variables	32

I. INTRODUCTION

Background

This investigation has been generated by the confluence of two currents of vital interest in the field of education: the urgent need for means by which to improve the educational milieu of the great majority of American Negroes, especially in the South, and the application of technology as a means for improving education generally. These issues will be addressed separately and in sufficient detail to make the inevitability of the confluence clear and understandable.

The educational levels achieved by the majority of Negro children in the South are deplorable. Data are available in ample quantity to illustrate the disparity between the achievement of Negro versus other (primarily Caucasian) children on all standardized tests at all levels of formal education from the first grade through college. This disparity averages two grade levels at the eighth grade (that is to say, Negro children are that far behind their Caucasian peers as indicated on standardized achievement tests). In 1960-61 the Human Development Clinic of the Florida State University conducted a regional study of a large Negro group the members of which for the most part fell into the lowest socio-economic, culturally deprived level (Kennedy, Van De Riet, & White, 1961). This study, drawing its sample from amongst elementary school children in five southeastern states, investigated the scores on standardized intelligence and achievement tests. Mean

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scores for the Negro children averaged 26 points below those of Caucasian upper and middle class children, and 20 points below the national norm (100).

Many reasons are advanced for this difference in achievement levels between Negroes and Caucasians. Educators, sociologists, psychologists, and anthropologists have addressed themselves to these postulated reasons which include Negro job opportunities, traditions, language, culture differences, and even the postulate that Negroes are innately of lower intelligence.

Reissman (1962) reports the reasons for the poor performance of underprivileged children in school as the following:

1. The lack of an educational "tradition" in the home;
2. Inadequate motivation to pursue a long range educational plan;
3. A poor estimate of self;
4. Antagonism toward the school and the teacher;
5. Poor health and diet.

Additional investigations have established the relationships between the poor academic performance of Negroes and factors such as teacher qualifications (Kyaraceus, 1966; Rivlin, 1966; Green, 1966), school environments (Gordon, 1965; Osborn, 1965), customs and traditions (Dowd, 1926; Rose, 1948), and parental attitudes (Beilin & Gotkin, 1967; Ausubel, 1967; Passow, 1967).

Of the various factors which have been studied, one which seems susceptible to direct attack through an educational process is parental attitudes. Parents profoundly influence their children's motivation

toward education by their own attitudes. In fact, they play such an important role in this regard that no school program can afford to neglect them (U.S. Office of Education, 1964). There exists a very real difference between the attitudes held by middle (and upper) class parents and those held by lower socio-economic, culturally deprived parents. The former understand the value of education, the need for a home environment conducive to intellectual stimulation, and the merit in encouraging their children to perform well in school. The latter are in general lacking in such understandings, they themselves having had a minimum of education, and that of an extremely poor quality.

If these relationships between parental attitudes and children's performance in school are indeed as causatively related as investigators have indicated, and for this investigation it is assumed that they are, it follows that any influences that make the parents' attitudes toward education more positive should increase the academic achievement of their children. This will not in itself solve the problem of low achievement among Negro children in the South, but it could at least be one of many attacks upon the adult aspects of the problem which, in their entirety, will result in its solution.

The second of the two currents mentioned is that of the impact of technology upon educational processes. In a Congressional report on automation and technology in education, the Joint Economic Committee stated that "developments in the storage, processing, and communication of information arising from the new technologies are creating the prospect of a complete revolution in our system of education. . ." (U.S. Congress, Joint Economic Committee, 1966). The same report stated in

part that "what seems to be called for is broader and better research into the means whereby schools can be made more effective, utilizing the available range of technology; and taking full advantage of what we do know about the learning process" (U.S. Congress; Joint Economic Committee, 1966)

Of the many communications technologies which have become available to education, the most complex; yet perhaps the most valuable, is the application of high speed computers to the instructional process. The application of computers in education has given rise to an educational technique known as computer-assisted instruction (CAI), or computer-based instruction (CBI). Numerous research projects have been carried on for the purposes of understanding the potential of the computer as an instructional aid (Hansen, 1969). There have been a few practical applications of the technique to educational systems, notably in New York City, Philadelphia, and Saginaw, Michigan. With minor exceptions, this research and application of computer-assisted instruction has been mostly at the elementary school and college level.

This investigation is concerned with exploring a means for improving the educational achievement of southern Negro children by positively changing the attitudes of their parents toward education as an institution, utilizing CAI as the instrument for change.

Need for the Investigation

The need for research of this kind may be considered from several aspects. There is, first, the need for technology and associated techniques which will help in making a breakthrough in the state of education for Negro children in the South. There is, therefore, a need to determine whether one such technique, the upgrading of parents' attitudes about education and related concepts, could indirectly have a beneficial impact upon their children's academic performance. This leads to a need to determine whether the attitudes of these parents can be changed by the application of modern educational technology, and if the answer is affirmative, whether technology, as exemplified by CAI, is superior to, equal to, or inferior to conventional lecture-discussion methods.

There is no reasonable doubt concerning the existence of the need of Negro educational status. Robert W. Sarnoff, President of the Radio Corporation of America, for example, has said, "There is no more challenging task than educating the under-educated" (Sarnoff, 1967). There are many professional educators who have recorded the deficiencies in the educational processes as they affect southern Negro children. Whether or not a breakthrough in the upgrading of education of Negro children in the South is possible remains to be demonstrated.

The need for a demonstration as to whether or not a changed parental attitude toward education and related matters will have a salutory effect upon the children's school performance has been fulfilled to some degree by Beilin (Beilin & Gotkin, 1967), Ausubel (1967), Passow (1967), and others.

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The need to demonstrate that computer-assisted instruction (CAI) can be effective in changing adult Negro attitudes toward education and related concepts has not been met.

Purpose and Objective of the Investigation

Several needs have been reviewed. The reason for such expression of multiple needs is that one grows out of the other, in a sort of hierarchy of needs. The specific purpose of this investigation was to demonstrate the effectiveness of computer-assisted instruction in attitude changing. The ultimate purpose was to create conditions that will enable southern Negro children to achieve better in school.

An objective may be considered as different from a purpose in that the former should be stated in terms susceptible to measurement, whereas the latter need not be so expressed. Such measurement should permit quantitative evaluation of the degree to which the purpose has been served through the planned efforts toward achieving it. In this context, then, one may say that the objective of this study was to assess the degree to which desired parental attitudes have been significantly changed by the application of computer-assisted instruction, and whether gains were significantly greater than the gains produced by traditional lecture-discussion techniques.

Hypotheses

The null hypotheses growing from the above discussion are as follows:

1. There is no significant change of attitudes of Negro parents concerning certain educational institutions as a result of

instruction by computer-assisted instruction (CAI).

2. The change, if any, of attitudes of Negro parents toward certain educational institutions as a result of instruction by CAI is not significantly different than that resulting from lecture/discussion treatment.

In order to take maximum advantage of the circumstances established to test these hypotheses, other relevant variables were measured as follows:

1. Age of the subjects
2. Number of children
3. Reading ability
4. Highest school grade
5. Score on an achievement test

II. RELATED LITERATURE

Review of the Literature

The literature contains a wide spectrum of research findings in the area of attitudes, their place in human personality, their alteration, and their measurement. It also provides a wealth of material on the sociological and cultural background of the American Negro, which provides an understanding of the present attitudes and values held by these people, and gives an orientation from which one may make a priori judgments as to those attitudes and values having an important bearing upon educational experiences.

There is considerable research which has been done in the area of education of American Negroes, as well as special programs, projects and curricula which have been set in motion for the specific improvement of Negroes' educational status.

There is limited research support (Hess & Shipman, 1965) concerning the importance of parental attitudes toward their children and the latter's education, and the effects of poor educational environments in the home upon children's hopes, ambitions, and self-images.

There appears to be very little, if any, evidence of research designed to measure the degree of attitudinal changes in undereducated Negro adults which may be effected by various educational techniques. There is no study of the feasibility of applying computer-assisted instruction to effect such changes.

Description of Available Attitude-Changing Treatments

If one were to be asked to devise a method by which attitudes might be changed in people, he would most likely begin by determining what is meant by the term "attitude." For that reason this discussion will begin with an attempt to define the term.

There are numerous hypothesized variables which serve the purpose of accounting for observed consistencies in human behavior. The construct called attitude is one such variable. Attitudes significantly influence people's responses to cultural products (for example an educational process), to individuals (a school teacher), and to groups of people ("white" people).

There are almost as many definitions of attitude as there are authors who have written definitions. But all appear to agree upon one common characteristic: Attitude entails an existing predisposition to respond to social objects which, in interaction with situational and other dispositional variables, guides and directs the overt behavior of the individual (Cardno, 1955). Of the many definitions, the one which has been accepted by the writer has been best expressed by Shaw and Wright (1967), who have said that an attitude is "a relatively enduring system of evaluative, affective reactions based upon and reflecting the evaluative concepts or beliefs which have been learned about the characteristics of a social object or class of social objects." The significant phrase in this definition is that which related attitudes to learned behaviors. Attitudes are learned, and therefore are, at least theoretically, subject to the laws of learning. It may be reasonably inferred that the psychology

of learning as applied to teaching will hold the same promise of success as it does for any other kind of concept learning.

It is concluded that attitudes may be learned, in fact <u>are</u> learned. They are learned through chance experience or exposure to social objects, and the attitude learned will depend upon the effect of the social object upon the learner's goals. Attitudes may also be learned through contrived learning experiences, ranging from very sophisticated techniques such as sensitivity groups to the simple technique of verbal intercourse between teacher and learner. Most of the established teaching techniques, from one end of the spectrum of sophistication to the other, have been used to change attitudes (or instill them where none previously existed), although the one which has been claimed as the most successful involves learning from a group of one's peers (Lewin, 1948). Lewin calls the process "re-education," which implies <u>changing</u> of attitudes already established, and these are probably the ones most difficult to change. Teaching new attitudes about social objects not heretofore encountered by the learner would seem to be relatively easy.

The task most commonly facing the educator is that of "re-educating," or altering attitudes already established in those seeking to learn. If high motivation and a posture of "open-mindedness" are characteristic of the learner, the task of attitude changing is less difficult, and any of the accepted learning strategies will suffice. If, on the other hand, attitudes held by the learner are firmly established and his approach to the teacher is one which may be described as, "go ahead and say what you have to say, but my mind is already made up about this matter," the task of teaching is not only difficult, but may be impossible.

Modern society is struggling with many inherent biases; attitudes about many social objects or processes have been firmly implanted by social customs, by parents and by peers. Some of these attitudes are in the best national (or societal) interests, some are not; some are even causing outright strife between segments of the society. It is therefore necessary, or at the least desirable, for educators to accept one of their responsibilities toward society by investigating all possible means of changing anti-social attitudes. The segment of society most easily educated is the age group between three and eight, and educators are in a position to teach these children the best of attitudes. But many attitudes are taught the very young "on the mother's knee," so the means by which educators can reach this age group may be only through re-education of the parent or parents, not a simple task.

Techniques for reaching parents with sufficient impact to change their attitudes about important social concerns need to be explored from the standpoint of effectiveness, feasibility, efficiency, and economy.

Description of CAI and Related Literature

Generalizations on computer-assisted instruction (CAI) can be divided into statements on (1) the requirement; (2) the potential benefits; (3) the state of the art; (4) the problems; (5) CAI as a factor in society; (6) necessary financial support; and (7) the trends (Hickey, 1968). Although each of these factors bears upon the problem under investigation, the one which is of significance is the potential benefits of CAI.

Stolurow (1967) sees in CAI the capability of (1) individualizing instruction, (2) doing research on teaching under controlled conditions,

and (3) assisting authors in the development of instructional materials. In 1965, Gerard described these benefits that CAI will bring to the student: (1) better and faster learning, since the student can time his learning at his convenience, go at his own pace, and catch up missed time; (2) better teaching at many levels and in many areas; (3) personalized tutoring; (4) automatic measurement of progress; and (5) the opportunity to work with rich materials and sophisticated problems (Gerard, 1965). For the teacher, the system takes away a great deal of drudgery and repetition, encourages frequent updating and changing of materials, and makes available more time for teacher-student contact. Wider social benefits may be envisioned in that the very best materials can be produced by master teachers and widely used repeatedly, modifications to the materials can be made almost at will, and the desperate shortage of teachers can be relieved.

Stated in the most simple language, computer-assisted instruction is the application of modern data processing equipment to the instructional process. Materials, prepared by the author, are arranged in special ways which make them adaptable to a kind of interactive programmed instruction format, and this material is introduced into the computer with the use of one of several languages which have been invented for this purpose. Strategies and tactics for obtaining and holding the students' interest are devised and made a part of the presentation of the material, all of which is introduced into the computer as part of its "program." There are several methods by which the student and computer are interfaced, the most common being the teletypewriter, and the student responds to instructions given to him by typing on the keyboard. This back-and-forth interchange allows for a fairly free "conversation" between pro-

gram in the computer and student. The degree of freedom of exchange depends upon the natural limitations of the system and the skill of the author/programmer.

The interactive programmed instruction (PI) format is most useful in CAI, and is discussed at length in this context by Stolurow (1965). CAI has moved programmed instruction into the realm of individualized instruction, but it would be incorrect to think that CAI is limited to the restraints of PI--the potential for innovativeness is only beginning to be understood as the state of the art progresses through research. This research can be viewed in two dimensions: the development of the technique itself, and the development of applications wherein CAI appears to hold special promise of advantages over conventional teaching techniques. The latter is the dimension of direct concern to this investigation.

III. METHOD AND PROCEDURE OF THE STUDY

General

The training and education of adults is a continuing and mounting problem facing educators. The needs of our technological world, the growing volume of knowledge, the requirements for information in the proper performance of jobs, and other reasons have placed added burdens upon adult and continuing education facilities and resources. The needs of our social world for practical means by which to re-educate, or alter the attitudes of people in all walks of life must also be met. As evidenced by the growing number of emotional confrontations, many rife with violence and destruction, between elements of the population, society appears to be facing an ever-increasing polarization of attitudes toward social objects and institutions. At the same time, the means by which to bring more tolerance and understanding toward others' viewpoints remains elusive. Computer-assisted instruction, as one outgrowth of modern technology, should be applied to this task.

In order to explore the possible benefits of computer-assisted instruction in changing the attitudes (re-educating) of a segment of society, computer-assisted instruction was administered to a selected group of adult Negroes with the objective of changing their attitudes about education for their children. The reasons for selecting this group were thoroughly explained in Chapter I, but succinctly iterated here as follows: Operating

under the general premise that scientific investigation may be most immediately beneficial if directed toward a social problem, and under the assumption that the educational achievements of Negro children are sufficiently below national standards to present a worthy social problem, this investigation was directed toward determining whether Negro parents' attitudes toward the education of their children can be significantly altered in a positive direction.

In the spring of 1968, the Board of Public Instruction of Wakulla County, a rural, somewhat economically deprived county in the "panhandle" of western Florida, applied for and was awarded a grant under Title I, Elementary and Secondary Education Act of 1965, for the installation and operation of computer-assisted instruction for the children of two of the county schools. These schools were the new consolidated high school, and the old all-Negro elementary school at Shadeville. The initial installation of equipment was scheduled for the Shadeville School, and consisted of an IBM 1050 teletype terminal, connected by telephone wire and UHF point-to-point radio telecommunication link to an IBM 1440 general purpose electronic data processing machine located at the Computer-Assisted Instruction Center, The Florida State University, located approximately twenty miles away in Tallahassee. Operation of the equipment commenced with the opening of the school year in September, 1968. The hours of operation available for the adult attitude program were between four p.m. and midnight.

A Description of the Instructional Materials

The summer of 1968 was utilized to structure a program of instruction consisting of six major topic areas or chapters which had as its objective the upgrading of attitudes held by most rural Negro parents concerning the importance of and need for education for their children. The topic areas by lesson number were as follows:

Lesson Number	Topic
1. (a)	Introduction to CAI and the Program
(b)	Early Childhood Development
2.	Family Relationships, Roles, and Attitudes
3.	The Value of Education
4. (a)	Review of Lessons 1, 2, and 3
(b)	Planning and Preparing for Vocations and Professions
5.	Desegregation and Your School
6.	The American School System

When the material had been assembled in normal text form, it was rewritten in interactive programmed instruction format and again rewritten in Coursewriter II, a language available to authors for communicating with electronic data processing equipment. The material was then introduced into the IBM 1440 computer, and debugged by administering to three subjects who typified the group for whom it was intended. By mid-September the material was debugged and ready for teaching the adult subjects at Shadeville.

The course materials are available at the CAI Center, The Florida State University. A sample lesson (number 3 of 6) is presented in Appendix A to indicate the general format as received by the student. It also demonstrates the CAI technique used and the style added to make the conversation between student and computer as meaningful and natural as possible.

Evaluation Procedures and Design

During the third week of September, 1968, two meetings of the parents of the Shadeville School children were held at the school under the sponsorship of the local Parent-Teachers Association. At the first meeting the investigator explained the program and administered the Adult Basic Learning Examination (ABLE, 1967) reading test to 67 volunteers. The ABLE reading test was used to identify those with a reading capability equal to the sixth grade national norm or better.

The 67 adults were randomly assigned to three groups as follows:

Group A (N=22) Randomly selected from the 67 volunteers but accepted only if reading level was sixth grade or better. This was the group to receive instruction from the computer, and the reading capability was necessary for interaction between subject and machine.

Group B (N=23) Randomly selected from the remainder of the volunteers.

Group C (N=22) All those volunteers remaining after selecting Groups A and B. This group was necessary as a control against the possibility that some (perhaps community) phenomenon not

under the control of the investigator might change the attitudes of Groups A and B.

At the second meeting all volunteers were administered a pretest, designed by the investigator to measure the subjects' attitudes toward education and related concepts. Shaw and Wright's (1967) book on attitude scales was used in designing a scale containing one hundred items (See Appendix B). Shaw and Wright (1967) claim that measures constructed with their items indicate reliabilities ranging between .68 and .93, with validities between .23 and .44. Analysis of the constructed attitude scale yielded Kuder-Richardson 20 internal consistency reliability coefficients of .85 and .91 for the pre- and posttests respectively.

After the pretest, Groups A and B received instruction, Group A from the CAI terminal and Group B from a certified Negro school teacher using a conventional lecture/discussion method. Both groups received equivalent information in their instruction, lecture class lesson outlines being derived directly from the CAI material by the author/investigator. Subjects in Group A received approximately one hour of CAI per week for six weeks, while Group B met in a classroom for approximately two hours per week for six weeks to participate in the lecture and discussion with the teacher. Group C subjects formed the control group and received no instruction of any kind.

One week after instruction was completed the three groups were brought together in order that a posttest could be administered. This test was identical to the pretest. In addition, a twenty-item concept achievement test was administered, an example of which is shown in Appendix C.

The following biographical data were collected concerning each of the subjects:

1. Age bracket of the subject. . .20-29, 30-39, 40-49, and 50 or over.
2. Number of children in the immediate family.
3. Whether the subject was the mother, father, or other. (There are many families in the Shadeville area in which the children are being brought up by relatives other than the natural parents.)
4. Highest grade level, as indicated by each subject in response to the question, "What is the highest grade you reached in school?"

In addition, the following measures were collected on each subject:

1. Reading grade level, as determined by the ABLE test.
2. Pretest score on attitudes, based on a maximum possible score of 465.
3. Posttest score on attitudes, similarly based.
4. Concept achievement test score, based on a maximum possible 100.

IV. ANALYSIS OF THE DATA

Testing the hypotheses. The investigation addressed itself primarily to the question of whether Negro parents' attitudes toward education could be changed significantly by a course of computer-assisted instruction, and if this could be done, that it was done more effectively than a similar course taught by lecture/discussion method. These hypotheses have been stated in the null form in the first chapter, but are repeated here for convenience:

1. There is no significant change of attitudes of Negro parents concerning certain educational institutions as a result of computer-assisted instruction.
2. The change, if any, of attitudes of Negro parents toward certain educational institutions as a result of computer-assisted instruction is not significantly different than that resulting from a similar course delivered by lecture/discussion method.

Table 1 shows the means of the pre- and posttest scores of the three groups of subjects, including Group C, the control group which did not receive instruction of any kind.

TABLE 1.--Means of scores on pre- and posttest attitude measures

	Group A	Group B	Group C
Pretest	359.1	351.7	349.6
Posttest	370.5	359.6	338.2

The data were first subjected to repeated measures analysis of variance for each group using Program BMD-08-V from the University of California Biomedical Computer Programs (Dixon, 1967) and the results are presented in Table 2.

TABLE 2.--Analysis of variance of means of pre- and posttest attitude measures

	df	MS	F
Group A	1	1371.43	9.20*
	20	149.18	
Group B	1	712.20	1.82
	22	391.29	
Group C	1	1095.56	2.13
	16	514.43	

*$p < .01$

The obtained F-ratio for Group A (9.20) was significant beyond the .01 level, that for Group B and Group C not significant at the .05 level.

From the analysis of these data, the conclusion is drawn that the first null hypothesis is rejected, the probability of a chance occurence of the change in attitude of the CAI group being less than one percent. The conclusion is further drawn that the second null hypothesis is rejected, inasmuch as the change in attitude of Group B has a probability higher than five percent of occurring by chance.

Other findings and inferences. The control group (Group C) was utilized as a safeguard against the possibility that both Group A and Group B showed significant changes in attitudes as measured by the scale. Had this been the case, it would have been necessary to compare these changes with the two attitude measures made on Group C in order to determine whether the changes were attributable to the instruction or to some other influence, not under the control of the investigator (for example, a serious desegregation problem occurring at the Shadeville School during the period of the investigation.) Because Group A indicated a significant change in attitudes as measured, and because Group B did not, the requirement for comparisons with Group C did not materialize. However, because data were available on Group C, and other data not directly relevant to the hypotheses were collected on all groups, further analyses were performed.

Table 3 shows the seven known variables observed during the investigation, with the means and standard deviations for each of the three groups and for the total subjects pooled together.

TABLE 3.--Means and standard deviations of the known variables for all subjects by groups and together

Variable	Group	Means	Standard deviation
Age of subject (by age bracket)	A	34	10 years
	B	35	19 years
	C	40	12 years
	All	36	10 years
Number of children	A	2.1	1.7
	B	2.6	1.9
	C	2.8	1.5
	All	2.5	1.7
Reading capability (by school grade level)	A	8.1	1.2
	B	7.0	1.6
	C	5.3	2.4
	All	6.9	2.0
Pretest scores on attitude scale	A	359.0	17.5
	B	351.7	26.6
	C	349.6	20.3
	All	353.7	22.1
Posttest scores on attitude scale	A	370.5	17.5
	B	359.6	31.0
	C	338.2	33.3
	All	357.4	31.1
Scores on achievement test	A	71.4	13.7
	B	68.7	8.3
	C	51.5	16.2
	All	64.8	15.1
Highest grade attained in school	A	11.1	3.7
	B	8.6	3.9
	C	7.0	2.8
	All	9.0	3.9

Using Program BMD-03-R from the University of California Biomedical Computer Programs, (Dixon, 1967), correlations were determined between the following seven variables:

1. Age bracket of the parent (subject)
2. Number of children in the subject's family
3. Reading level (grade) of the subject
4. Pretest score on attitude scale
5. Posttest score on attitude scale
6. Achievement test score
7. Highest school grade achieved by the subject

The correlations of these with each other are expressed in Table 4, as correlation coefficients by groups.

TABLE 4.--Correlation coefficients of seven variables by groups

Group A	Age	Children	Reading	Pretest	Posttest	Achievement	Grade
Age	1.00	.00	.00	.18	-.19	.02	.00
Children		1.00	-.20	-.14	-.30	-.22	-.33
Reading			1.00	.67	.64	.56	.35
Pretest				1.00	.62	.16	.10
Posttest					1.00	.37	.16
Achievement						1.00	.64
Grade level							1.00

For Group A (N=21) correlation coefficients of .43 and .55 are significant at the .05 and .01 level respectively.

TABLE 4 --Continued

Group B	Age	Children	Reading	Pretest	Posttest	Achievement	Grade
Age	1.00	-.25	-.35	-.14	-.43	.05	.00
Children		1.00	.08	.00	.13	-.01	-.08
Reading			1.00	.67	.72	.50	.28
Pretest				1.00	.54	.25	-.06
Posttest					1.00	.50	.13
Achievement						1.00	.05
Grade							1.00

For Group B (N=23) correlation coefficients of .41 and .53 are significant at the .05 and .01 levels respectively.

Group C							
Age	1.00	-.14	-.55	-.56	-.48	-.08	-.75
Children		1.00	.34	.07	.36	.25	.28
Reading			1.00	.38	.58	.30	.43
Pretest				1.00	.36	.20	.45
Posttest					1.00	.25	.46
Achievement						1.00	.41
Grade level							1.00

For Group C (N=17) correlation coefficients of .48 and .61 are significant at the .05 and .01 levels respectively.

TABLE 4.--Continued

All Subjects	Age	Children	Reading	Pretest	Posttest	Achievement	Grade
Age	1.00	-.08	-.43	-.20	-.45	-.18	-.27
Children		1.00	-.01	-.05	-.01	-.08	-.16
Reading			1.00	.53	.71	.57	.47
Pretest				1.00	.51	.23	.15
Posttest					1.00	.48	.35
Achievement						1.00	.48
Grade level							1.00

For all subjects (N=61) correlation coefficients of .25 and .33 are significant at the .05 and .01 levels respectively.

The highest correlation coefficients between any one of the variables and the other six are those between the reading ability as measured by the ABLE test and the other variables. The obvious inference from this outcome is that the ability to read the items of the scales and the achievement test had a direct effect upon the scores on those measures. However, it should be here stated that at the time of the administration of the measures, the investigator, in order to reduce to a minimum the effects of reading ability, read aloud twice each of the attitude scale and achievement test items as the subjects went through the measures item by item, indicating on a large blackboard the possible choices available in the response selection boxes. At the same time a Negro teacher circulated among the subjects, responding to any and all inquiries about meaning of words, meaning of the statements, or method of responding. Inasmuch

as the lowest tested reading capability of any subject was third grade level, and because of the precautions taken against inability to understand the test items as written, the inference is drawn that the apparent high correlation between reading level and test scores is not because of ability or inability to read the statements and questions, but rather to a difference in intellectual capability which is attributable to reading capacity. As Hess and Shipman (1965) have expressed this concept, "...language shapes thought and cognitive styles of problem-solving." Increased reading ability implies increased vocabulary plus higher cognitive skills.

It is nevertheless important to analyze the impact of this intervening variable, of which reading capability is an indication, upon the achievement test scores and the pre- and posttest scores for the attitude measures. The first step was to perform an analysis of variance with repeated measures, using a program written by Hartford and King (1962). Table 5 gives the outcome of this analysis.

TABLE 5.--Analysis of variance with repeated measures for the three groups, using the pre- and posttest scores on attitude measure

Source	df	MS	F
Between subjects			
Groups (G)	2	4084.98	4.20*
Within Groups	58	972.42	
Within subjects			
Measures (M)	1	426.10	1.25
G by M	2	1376.54	4.03*
M by Within groups	58	341.77	

* $p < .05$

This analysis indicates that the difference between groups on the attitude scores is significant at the .05 level. In addition, the interaction term, groups by pre-post measure, was also statistically significant beyond the .05 level.

An analysis of covariance on these same attitude measure scores, with reading scores the covariants, developed the F-ratios as shown in Table 6.

TABLE 6.--An analysis of covariance, all three groups, pre- and posttest scores on attitude measures, reading scores the covariant

Source	df	MS	F
Between subjects			
Groups (G)	2	83.60	.162
Within groups	58	514.99	
Within subjects			
Measures (M)	1	425.80	1.290
G by M	2	284.22	.861
M by Within groups	57	329.29	

As can be observed in Table 6, all of the main effects and the interaction were statistically non-significant.

This analysis reveals the influence of the reading ability upon the attitude scores in that covarying reading effects leads to a set of non-significant outcomes. The impact of the reading performance level was undoubtedly present during the testing sessions despite the fact that all the attitude items were orally read to the subjects in all three groups.

An analysis of variance on the reading scores points up the disparity between the capability of the groups and within the groups. The results of this analysis are shown in Table 7.

TABLE 7.--An analysis of variance, all three groups, reading scores

Source	df	MS	F
Between groups	2	37.15	12.22*
Within groups	58	3.04	

*$p < .005$

The F-ratio in the above analysis is significant beyond the .005 level. This significance points to the need for an adjustment of the attitude scores for the variable indicated by reading ability, and Table 8 indicates the results of such an adjustment.

TABLE 8.--Means of pre- and posttest attitude scores adjusted for reading ability

Group	Pretest	Pretest(adjusted)	Posttest	Posttest(adjusted)
A	359.1	352.3	370.5	357.7
B	351.7	351.0	359.6	358.3
C	349.6	358.9	338.2	355.8

There was one other outcome of the attitude measures which invites comment: the decrease in mean scores between the pretest and posttest as observed in the control Group C. Inasmuch as this group received no treatment of any kind except being ignored while Groups A and B were receiving instructional attention, the conclusion was reached that the fact of such exclusion from participation may have resulted in a change of attitudes in the negative direction.

Although a measure of achievement as a result of the instruction was not directly relevant to the hypotheses under test, such a measure was made as an ancillary part of the investigation in order to substantiate the postulate that changing attitudes is a learning process. This achievement test was administered to both the instructed groups and the control group, which received no instruction. The means and standard deviations of the test scores are shown in Table 9.

TABLE 9.--Means and standard deviations, scores on achievement test

Group	A	B	C
Mean score	71.43	68.70	51.47
Standard deviation	13.71	8.29	16.18

Subjecting these data to a one-way analysis of variance using BMD-01-V from the University of California Biomedical Computer Programs (Dixon, 1967) gives the results shown in Table 10.

TABLE 10.--One-way analysis of variance on scores of achievement test for all subjects

	df	MS	F-ratio
Source			
Between groups	2	2146.06	13.16*
Within groups	58	163.04	

*p < .005

The F-ratio is significant beyond the .005 level, and the conclusion was drawn that the difference between groups was significant. To confirm the observable evidence that this variance was primarily attributable to the subjects of Group C, which did not receive instruction, a second one-way analysis of variance was performed on Groups A and B only, with results as shown in Table 11.

TABLE 11.--One-way analysis of variance on scores of achievement test for Groups A and B

	df	MS	F-ratio
Source			
Between groups	1	81.99	0.65
Within groups	42	125.43	

This F-ratio is not significant at the .05 level, and the observation that the variance in scores was primarily attributable to the subjects of Group C was therefore confirmed.

The question of the impact of reading ability was, as it was with the attitude scores, relevant to the difference in achievement scores between Groups A and B and Group C. A stepwise regression program from the Biomedical Programs (Dixon, 1966) was used to determine the amount of total variation about the mean of the achievement scores which is due to each of the known variables. The results of this analysis are shown in Table 12.

TABLE 12.--Coefficients of determination R^2 for all variables

Variable	Cumulative R^2	Increase in R^2
Reading ability	.326	.326
School grade	.384	.058
Posttest	.393	.010
Age	.407	.013
Pretest	.416	.009
No. of children	.417	.001

The conclusion indicated by these data was that the total known true variance is 42 percent of the total variance (the remainder being error variance or unidentified true variance), and of this known true variance, reading ability accounts for 78 percent. As might be expected,

highest school grade reached by the subject contributed the next highest amount of the true variance (14 percent), while the other known variables contributed 3 percent or less each.

V. DISCUSSION

Interpretation. There are four interpretations which the investigator has made of the outcomes of the experiment. These may be listed as:

1. The outcomes of the tests on the hypotheses;
2. The meaning of the negative direction of change of the attitudes of the non-treatment group;
3. The need for reading ability in adults before administering educational or training instruction;
4. The applicability of CAI for adult education.

The outcome of the tests. The tests on the hypotheses were conducted on relatively small samples of the population (southern Negro parents of school children), and the results must therefore be considered as empirical rather than theoretical in nature. Additionally, the requirements for a specified reading capability for the experimental group, together with the limited number of subjects available for involvement in the experiment, give further need for caution in generalizing from the outcomes. Nevertheless, within the constraints of the experimental circumstances, the instruction by computer did result in a significant change of the attitudes of the subjects in a positive direction, insofar as the attitude measuring instrument was able to discern. Furthermore, the same material presented to another group of subjects by conventional lecture/discussion method, while also producing some measured positive change in

attitude, did not produce as much change as the CAI, the difference between the outcomes being also significant.

The meaning of the negative change. It is considered to be of significance that the attitudes of the members of Group C, which received no treatment at all, changed in any way, and particularly that they changed in the negative, or undesired, direction as measured by the attitude scale. This group had been selected and tested in order that there be a control against the possibility that the attitudes of both the experimental groups receiving instruction had shown changes to a statistically significant degree. Had this been the outcome of the experiment, it would have been necessary to determine if these changes were attributable to the instruction or to some other influence, neither planned nor under the control of the experimenter. According to the observations only one of the experimental groups showed changes in attitude to a significant degree, and therefore, the measures made on Group C were in fact superfluous to the hypotheses. However, the fact that the attitudes of this non-treatment group changed negatively is important in that it may be interpreted as an indication of the impact of being "left out" upon adults who are aware that their peers are receiving some special program.

The need for reading ability. The correlation coefficients between reading level as measured by a standardized test with both the attitude and achievement tests were significant. However, in considering the interpretation of this information, it is necessary to do so in the light of the means taken by the experimenter to eliminate insofar as

possible the effects of disparity in reading abilities. The approach was to read aloud, twice, each item of each test instrument as the subjects were responding to them, pausing to answer questions about the meaning of each item when requested, and indicating on a large blackboard the alternatives available to the subject in making his responses. If it can be assumed that these precautions against being unable to read the test items eliminated the variance in reading capability, and the investigator has made this assumption on the basis of his intimate involvement with the experimental circumstances, then the correlations noted above must be interpreted in some way other than the obvious. The interpretation of the observed relationships between reading ability and test scores is that intellectual capability, or the cognitive capacity for problem-solving, is highly correlated with the ability to verbalize, and this latter ability is enhanced in direct proportion to reading ability. Thus the impact on attitudes from a learning experience will be dependent upon this cognitive reading ability.

Applicability of CAI for adult education. While not a question directly addressed in the experiment, the reaction of the adult subjects to the unique experience of direct conversational communication with a computer is important to the field of adult education, especially adult basic education. One of the unknowns facing the investigator was whether rural, relatively uneducated and unsophisticated Negro adults could accept a course of instruction presented to them in a wholly new and very sophisticated way. The observed reactions of the subjects to the CAI method can only be interpreted as enthusiastic. Their involvement was complete. Once the initial timidity with a new machine had been overcome, the concentration and attention to the material was total.

Most subjects arrived well in advance of their appointments with the CAI terminal, and no appointments were missed throughout the six weeks of instruction. The IBM 1050 terminal is of the kind which uses a teletypewriter, with continuous paper feed, for communications between the computer program and the student. This proved to be an especially appealing device for these subjects, because they were able to tear off a typewritten record of their conversation with the machine, not only for purposes of review and record, but as "evidence" of their involvement with a wholly new experience.

Implications. The interpretations placed upon the outcomes of this investigation indicate several very important implications, both for the technique of computer-assisted instruction and for adult education. These are described in the same four general dimensions as were the interpretations in the previous section.

The outcomes of the tests. The implications of the significant ability of an adequately written program of computer-assisted instruction to provide learning experiences to adults, especially adults with little formal education (averaging eighth grade level), portends an entirely new application for CAI. CAI installations are being made in a number of locations at the current time, mostly in public school systems and colleges. The Board of Education CAI program in Manhattan is typical of the growth of the technique as a means for teaching elementary school children. The new avenue which seems implied by this experiment is the opportunity for doubling the utilization of expensive CAI installations by making them available for adult programs of instruction during the hours when the

equipment is otherwise unused by the children. Especially noteworthy is the possible application of CAI on a large scale for teaching adult basic education programs, which kinds of curricula are the most easily adapted to CAI limitations of presentation.

The meaning of the negative change. In casting about for plausible explanations for the negative change in attitudes as measured in the untreated subjects, the investigator has concluded that one likely such explanation is that those who did not participate in the instructional program felt a sense of being "left out" of something which had been made available to their friends and peers. This feeling may well have manifested itself in a negativeness which was subconsciously expressed in the scores of the attitude scales. If this were the case, the implications for adult education programs, and other kinds of social programs as well, such as experimental welfare programs, is that they may be expected to generate negative feelings in those who are left out of such programs for various reasons. Knowing this, program planners may be able to involve all volunteers in some meaningful way in their programs.

The need for reading ability. The postulate that reading capability has a direct relationship to cognitive ability has considerable implications for adult basic education programs. Many such programs are directed at teaching skills which may not in and of themselves require more than a most basic reading skill. This experiment indicates that the capacity of the functionally illiterate adult to learn even such elementary skills is lessened if that teaching involves any problem-solving effort by the subject. The important implication is that before giving any kind of

instruction to functionally illiterate adults, reading skills should first be taught which will provide the adult students with a reading capability approximating the seventh-to-eighth grade level.

The investigator believes that these implications are important to adult education, and that they point toward the need for further research, particularly leading to more substantial evidence of the capacity of CAI for instruction of adults, especially adults in need of basic education. In addition, there is a need for research leading to further evidence of what might be called a "contra-Hawthorne effect," that is, the effect of non-participation in social programs. Also, research which might lend further credibility to the postulate that reading capability is a determinant of cognitive capacity for problem-solving would be fruitful.

APPENDICES

APPENDIX A

SAMPLE OF CAI LESSON

APPENDIX A

SAMPLE OF CAI LESSON

Following is an extract from the CAI lesson as printed by the teletypewriter, with typical student responses.

C = Computer S = Student

C - Good evening, Worth Scanland.

It is a pleasure to meet with you again.

This evening we are going to talk about a most important thing: the value of education. We shall try to answer the question, "What are the reasons my child should get all the education he (or she) can?"

Below are some reasons why your child should go to school. Please indicate the one you think is the most important reason.

1. To stay out of trouble
2. To learn to read and write
3. To stay away from the truant officer
4. To become a better person
5. To give me some peace at home
6. To learn to get along with other children

S - 2

C - Yes, that is a good reason, but not the most important reason. Please try again.

S - 4

C - That's right. Of all the many good reasons for getting all the education we can, the most important one is that it will help make us a better man or woman, a better citizen, and a better parent.

The faith that we as Americans have in our way of living and working together rests on the solid fact that all men and women (and boys and girls) are capable of being made more responsible and more intelligent through training. Such training is the function, or purpose, of two institutions: the home and the school. Last week and the week before we talked at length about the training which goes on in the home and family. Today let's talk about the importance of the training (education) which is the responsibility of our schools. EOB to proceed.

Americans have, since the earliest colonial days, placed great importance in an education for all citizens. This understanding of education's value has grown constantly with each generation. Seventy-five years ago most Americans could receive an elementary education if they wished, and a few could go on to the 9th and 10th grade. A very, very few could go on to college. Today everyone can have a high school education, and if he wants it badly enough, any normally intelligent boy or girl can go through college--it takes hard work by both student and parents, but it is within the reach of us all.

Of the choices offered below, which most nearly states how many Americans received high school educations in the year 1900?

1. 1 of every 100 Americans
2. 10 of every 100 Americans
3. 30 of every 100 Americans
4. 50 of every 100 Americans

S - 3

C - Now, try the same question for today. How many Americans received high school educations in 1967?

1. 1 of every 100 Americans
2. 10 of every 100 Americans
3. 30 of every 100 Americans
4. 50 of every 100 Americans

S - 3

C - I asked these questions not really to see if you knew the answers, but to make you think about the great changes which have been and are still taking place in our ideas about education.

The answer to the first question is No. 1, that is, about 1 person in every 100 received a high school education.

The answer to the second question is No. 4, that is, 50 persons in every 100 received a high school education last year. That is a very great change indeed.

EOB to proceed.

Not only is the opportunity for education becoming more and more available to everybody, but the need for education is becoming greater every day.

How do you feel about the importance of education? One way to answer this question is to say whether you believe the following statement is true or false.

It was more necessary for me to have a good education than it was for my parents, and it is also more important for my children to have a good education than it was for me.

1. False 2. True

S - 1

C - No. Think about this some more, and try again.

S - 2

C - You are absolutely correct.

The reason for this is that almost everything in our day by day adult world is getting more and more difficult to understand without having a good education to help. The skills necessary to handle almost every good job are becoming more and more complex, or hard to learn. Not long ago a man who had a hammer, saw and few other hand tools could get a good job as a carpenter, for example. Not any more. Now he must know how to read a blueprint, make accurate measurements, do arithmetic, understand why a bubble level works, and many other things which only education and training can provide.

Do you think it is harder to get a good job without a high school diploma today than it was 30 years ago?

1. Yes 2. No

S - 2

C - Please read again the paragraph just before the question, and try another answer.

S - 1

C - You bet it is, and as time goes by it will become much more difficult to hold a good job, or almost any job, without having a high school education.

Besides the very real need for education in order to earn a good living, there are some other important reasons which we might look at together.

I am going to list a few of these other reasons why education is so very important to your children. Here they are:

1. Education helps people understand the world they live in, as well as what is happening in the world. Then when they read a newspaper, or listen to the news on radio to TV, they understand the meaning of what is happening.

2. Education makes people better citizens by giving them the knowledge on which to base opinions about the problems of their community (town, county, state, or nation). It helps people make good decisions about their government and leaders, and to vote for their own best interests.

3. Education makes people better citizens by giving them the knowledge on which to base opinions about the problems of their community (town, county, state, or nation). It helps people make good decisions about their government and leaders, and to vote for their own best interests.

4. Education allows people to enjoy more things more fully, such things as good books, good music, good talk with other educated people. It is often said that education lets people lead fuller lives. Anyone can enjoy a flower, but one's joy is more complete if he knows what kind of a flower it is, how it grows, where it grows, why it must have earth, sunlight, air and water to live.

5. Education is the way we "transmit our culture," which is a fancy way of saying that people use education to pass along to their children everything that their parents, and their parents' parents all the way back, have learned about living.

6. Education will allow our children to live better lives than you and I are living. It will permit them to live in better houses, wear better clothes, travel to other places, and all the things which having better jobs can bring. If your child gets a good education, he may be able to move a step or two higher than you have on the ladder of importance to his community and neighbors.

EOB to proceed.

Now then, there are certainly enough good reasons for getting all the education one can. Read again carefully the six I have listed above.

Have you read them all a second time?

1. Yes I have. 2. Not yet.

S - 2

C - O.K. Keep at it, and when you have finished, press No. 1 key.

S - 1

C - By pressing a key from 1 to 6, tell me which <u>one</u> of the reasons <u>you</u> think is the most important.

S - 2 (any key from 1 to 6 brings the same next response from the computer.)

C - That's great, and good thinking too. I picked that same one, so we agree.

Please do me a favor. When you have the chance, will you sit down with your oldest school child and see if you can explain to him why you selected that particular answer to my question?

1. Yes I will 2. I don't think I can.

S - 2

C - Let me sum up how I feel about education for your children by repeating what a very smart preacher said nearly 200 years ago. His name was the Reverend William Barrow, and he said,

> "Every man is what his education has made him, so wonderful is the difference between what he is at his birth and what he can become when he matures."

EOB to proceed.

Thank you for sharing this time with me. Please be here for the next meeting, when we will talk about the many kinds of work your children can train for. Please tell the proctor you are finished. He will help you "sign off."

APPENDIX

THE PRE- AND POSTTEST ITEMS

APPENDIX B

THE PRE- AND POSTTEST ITEMS

Following are the 100 items which make up the attitude scale, used as both pre- and posttests.

In the test form the subjects are asked to indicate their feelings about each item on a scale of:

Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree

Scoring ranged from 1 through 5. Items marked herein with an asterisk were not scored.

ITEMS

1. All things considered, my children should receive as much education as they are capable of accepting.

2. Education is more valuable than most people think.

3. Teaching has more influence on a nation than any other profession.

4. The school should try to give children help with the social problems they face in their every day life.

5. Education is no help in getting a job today.

6. Desegretation means the right of every citizen to share equally with every other citizen the privileges and responsibilities of being an American.

7. Teaching is one of the best means of serving humanity.
8. Parents should not be compelled to send their children to school.
9. My child spends enough time on homework.*
10. Modern teaching is not as good as that twenty years ago.
11. A man should be willing to sacrifice anything for his family.
12. Much of what my child is studying in school will be useful to him after he finishes school.
13. One cannot find as much understanding at home as elsewhere.*
14. All laws, even small ones such as traffic laws, apply equally to all people regardless of race, creed, or color.
15. My child is getting a lot from his schoolwork.
16. Teachers do not take enough interest in their jobs.
17. Anybody should be allowed to enter any university he chooses if he is smart enough.
18. There are things my child should be learning right now which are not being taught in school.
19. Public money spent on education during the past few years could have been used more wisely for other purposes.

20. Parents should give children of elementary school age or older reasons for any requests made of them.

21. Most young people are getting too much education.

22. A person should always help his parents with the support of younger brothers and sisters if necessary.*

23. Birthday parties and the giving of presents to children are likely to spoil them, and should be avoided.

24. A parent should try to punish his (or her) child only in private.

25. People teach only when they can find nothing else to do.

26. Some people feel that the only way the schools can keep up the services they are now giving is to increase taxes. If this turns out to be true, taxes should be increased.

27. A child who steals should be made to feel ashamed of himself.

28. Children should NOT be allowed to interfere with the social or recreational activities of their parents.

29. Children living at home should always obey their parents.

30. It is possible to show too much love for a child.

31. The teaching profession is better than the bricklaying trade.

32. Parents should praise their children in the presence of oursiders.

33. Kindergartens and nursery schools are very good for children of preschool age.

34. If one parent refuses a child's request, the other parent should refuse it also.

35. A high school education helps make a man a better citizen.

36. I am satisfied with the way my child is treated by the teachers and principal at school.

37. Children should be trained to do things for themselves as early in life as possible.

38. A profession has a better chance of developing good citizens than a craft or trade.

39. Savings spent on education are wisely spent.

40. Teachers are paid too much for thewwork they are expected to do.

41. Most teachers have a one-track mind.

42. A man is foolish to keep going to school if he can get a job.

43. A child should be encouraged but NOT required to say "Please" whenever he makes a request.

44. A Negro vote is counted as much as a white person's vote.

45. A high school education is worth all the time and effort it requires.

46. My child's teacher knows my child as well as she should.*

47. A parent should NEVER "give in" to a child.

48. Education only makes a person discontented.

49. Desegregated social activities at school are beneficial to everybody.

50. The Army's policy of desegregation is an advance toward interracial understanding.

51. The more education a person has the better he is able to enjoy life.

52. The family should talk over together its important decisions.

53. A man can learn more by working four years than by going to high school.

54. Whenever a young child fails to come home from school promptly, his parents should question him as to where he had been.

55. The best way to solve the race problem is to encourage Negro and White people to share equally in the responsibilities of being good citizens.

56. The joys of family life are overrated.*

57. As an American citizen it is my privilege to share with other citizens all facilities paid for with tax dollars.

58. School training is of little help in meeting the problems of real life.

59. The national service academies, such as the Military Academy at West Point, are open to all boys who are physically and mentally qualified, regardless of race or color.

60. Child training should encourage an individual to think for himself.

61. A person should always avoid every action of which his family disapproves.

62. An educated man can advance more rapidly in any business than an uneducated man.

63. I would accept a traffic ticket as graciously from a White as from a Negro police officer.

64. One ought to discuss important plans with the members of his immediate family (wife or husband and older children).

65. The head of the house should always consider the needs of his family as more important than his own.

66. As an American citizen I have the right to join any club I wish.

67. If one child in a family is less quick to learn than another, his parents should spur him on by constantly pointing out the superiority of the other.

68. As a citizen it is my responsibility to eat in a public restaurant.

69. I know as much about my child's school as I want to.*

70. As a citizen it is my privilege to eat in a public restaurant.

71. At least one married child should be expected to live in the parental home.

72. A person should always be expected to defend his family against outsiders even at the expense of his own personal safety.

73. I do not mind having my children taught by a White school teacher.

74. High school courses are too impractical.

75. If a child wants to destroy his own playthings, he should be allowed to do so.

76. Schools train the nation's leaders.

77. In a crowded cafe I would not mind sharing a table with people of a different race.

78. Only subjects like reading, writing, and arithmetic should be taught at public expense.

79. Children should NOT be teased.

80. I favor evening school for adults who want to continue their education.

81. No citizen may claim any privilege of citizenship unless he is prepared to share in the responsibilities.

82. All citizens are responsible for protecting the privileges of all other citizens.

83. The school does not seem to really care about my child.

84. Children should be allowed to do as they please.

85. The importance of education is overrated.

86. Americans are making progress toward a goal of equal opportunity for all citizens.

87. I know my child's teacher as well as I want to.

88. I would not object to my children participating in athletic events with both White and Negro children.

89. Violation of household rules should never be overlooked.

90. A child should never be forced to do a thing he does not wish to do.

91. The reason for discipline is to teach my child self-control.

92. I am satisfied with my child's school.*

93. Teachers expect too much of the students.

94. Parents are too particular about the kind of company their children keep.

95. Education helps a person to use his leisure time to better advantage.

96. If a parent threatens a child with punishment, this should be carried out.

97. The discipline at school is too strict.

98. The best kind of life work for my child to train for is the one which will earn him the most money.

99. Children will learn best when taught by teachers of their own race.

100. A child should start planning for his adult work after he finishes high school.

APPENDIX C

ACHIEVEMENT TEST

APPENDIX C

ACHIEVEMENT TEST

Following is the 20-item achievement test, scored on the basis of five points for each item correctly answered.

1. Below are some reasons why your child should go to school. Please indicate the one you think is the most important reason.

___a. To stay out of trouble

___b. To learn to read and write

___c. To stay away from the truant officer

___d. To become a better person

___e. To give Mother some peace at home

___f. To learn to get along with other children

2. Who should make the decision to have a small vegetable and flower garden in which everyone will share in the work?

___a. The family ___b. The head of the house

3. About how many Americans received high school educations in the year 1900?

___a. 1 of every 100 Americans

___b. 10 of every 100 Americans

___c. 30 of every 100 American

___d. 50 of every 100 Americans

4. What was the purpose of our meetings?

___a. To learn about children

___b. To improve our children's school work

___c. To better understand the P.T.A.

5. Is this statement true or false?

The schools, the church and the police are responsible for our children's health, protection, guidance, and education.

___ True ___ False

6. Is this statement true or false?

The average parent does a poor job of bringing up his children.

___ True ___ False

7. Which of these traits is your child born with?

___a. Color of skin

___b. Wild temper

___c. Love of music

___d. Intelligence

___e. Honesty

8. One of these is an important basic need of all children. Which one?

___a. Money

___b. Happiness

___c. Pleasure

___d. Security

___e. Education

9. Who should decide what values are to be taught the children?

___a. The preacher

___b. The parents

___c. The teachers

___d. Grandmother

10. Children learn their respect for authority from which of these:

___a. Their teachers

___b. Their parents

___c. The sheriff

___d. The television

11. Does a child learn good things and bad things with equal ease?

___ No ___ Yes

12. Is this statement true or false?

The purpose of disciplining a child is to teach him self-control.

___ True ___ False

13. To obtain the best results, punishment should be administered

___a. Publicly ___b. Privately

14. Is this statement true or false?

Lying and stealing are best cured by a good, sound whipping.

___ True ___ False

15. Which of the following vocations is classed as a profession?

___a. Nurse

___b. Teacher

___c. Brick mason

___d. Dentist

___e. Watch repairman

16. Desegregation is the idea of sharing by all citizens in the privileges, opportunities, and _____of being Americans. (Please fill in the missing word.)

17. Is this statement true of false?

It is every citizen's privilege to join together with any other citizens to form a private group from which they may exclude, or refuse membership to, anybody for any reason, or even for no reason.

___ True ___ False

18. The laws which require all children to attend school are called

___a. Equal opportunity laws

___b. Blue laws

___c. Compulsory education laws

19. There are four "levels" of supervision of public education. Of the five listed below which one doesn't belong in the list?

___a. The national level

___b. The regional level

___c. The state level

___d. The county (district) level

___e. The school level

20. Which one of the following is NOT a basic ideal of our school system?

___a. Compulsory education

___b. Local control

___c. Equality of opportunity

___d. Parent-teacher associations

APPENDIX D

PARTICIPATING AGENCIES

APPENDIX D

PARTICIPATING AGENCIES

Several agencies participated in one way or another in making this investigation possible. Briefly their identification and participation may be stated as follows:

1. The Center for Computer-Assisted Instruction, The Florida State University, generously allowed the use of its IBM 1440 for storage and output of the CAI program. The Center receives most of its support through a number of grants for the general purposes of research in CAI.

2. The Wakulla (Florida) County School Board made available its remote CAI terminal located at Shadeville, Florida, for use by the subjects of the investigation. This equipment was funded by a project under Title III, Elementary and Secondary Education Act of 1965 (U.S. Office of Education).

3. The Florida State University Computer Center provided computation services for the statistical analyses.

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